

## Remarks

Each of the cited references has been reviewed and the rejections made to the claims have been considered.

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**Claims 1-5, 7-11, 13-15, 17-20, and 23-34 are allowable in light of amendments and arguments overcoming rejections under §103**

Claims 1-15, 17-20, and 23-24 were rejected under 35 USC §103(a) as  
10 being unpatentable over Wu.

Applicant's claims are directed to an overlay signal of OFDM modulated digital data that is combined with a standard composite video television signal.

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Wu also discloses an overlay signal of OFDM modulated digital data that is combined with a standard composite video television signal, but Wu uses a different technique for overlay. In Wu, interference caused by the OFDM signal on the analog NTSC video is minimized or  
20 avoided by employing three techniques:

1) switching off carriers and creating notches in the OFDM spectrum where energy from the video carrier is located, at 15.75 kHz intervals, multiples of the horizontal line rate. (Wu, column 7,  
25 lines 10-17, column 5, lines 44-50). The notches in the OFDM spectrum correspond to the peaks of the video carrier spectrum components.

2) Varying the amplitude of the digital data carriers according the  
30 position of the digital carriers relative to the fundamental video carrier, that is, the digital carrier amplitudes are higher at frequencies close to the video carrier fundamental and lower at

frequencies farther away from the video carrier fundamental. (Wu, column 8, lines 37-41; Fig. 13).

3) Varying the spectral efficiency of the digital data carriers in  
5 between the NTSC spectral components, wherein higher order  
modulation is used in the middle of the notches/spectral components  
where the noise floor from the NTSC signal is lower. The modulation  
is varied, using more robust QPSK near the notches/spectral  
components where noise is high and less robust 16QAM in the middle  
10 where noise is low. This technique allows increasing the data  
transmission rate while not impacting the NTSC signal. (Wu, column  
8, lines 42-56)

Applicant's invention addresses interference from the OFDM signal on  
15 the NTSC signal and interference from the NTSC signal on the OFDM  
signal by employing techniques that are different from Wu.

First, specifically, applicant's invention avoids interference  
between both the OFDM signal and the video signal by locating the  
20 OFDM signal in the vicinity of the spectral minimum of the NTSC  
signal (published application, paragraph 0038 and Fig. 1).

Second, the OFDM signal is pre-equalized (also called comb filter  
equalizer) in the transmitter to compensate for the effects of comb  
25 filtering in the receiver (application, paragraph 0044, 0046, figure  
4).

Third, the OFDM signal is synchronously combined, in the time  
domain, with the active horizontal video line for transmission  
30 (application, paragraph 0020, 0042), using synchronization  
information extracted from the video signal, then gated and windowed

in the receiver to avoid interference from the NTSC signal  
(application, paragraph 0048, 0053).

5 Wu does not disclose locating the OFDM signal at a point of spectral  
minimum in the composite video signal. Wu does not disclose pre-  
equalizing in the transmitter to compensate for the effects of comb  
filtering in the receiver. Wu does not disclose synchronously  
combining the OFDM signal with the active horizontal video line for  
transmission using synchronization information extracted from the  
10 video signal. Wu does not disclose gating and windowing in the  
receiver to avoid interference from the NTSC signal

Claim 1 has been amended to include the limitation of pre-equalizing  
the generated in-phase and quadrature symbol streams according to  
15 comb filtering effects. Pre-equalizing to compensate for the effect  
of comb filtering is not disclosed in Wu; the multilevel encoder in  
Wu creates QAM symbols but does not perform a pre-equalizing  
operation on the symbols.

20 In view of the foregoing amendment and arguments, claim 1 is in  
condition for allowance and such action is respectfully requested.

Claim 2 has been amended to include the limitation of translating  
the OFDM signal to be at a region of spectral minimum of the video  
25 signal. Dependent claim 2 is now allowable in light of claim 1  
being allowable and this amendment to claim 2.

Claims 3 and 4 are dependent on claim 2 and are thus allowable along  
with claim 2. Claim 4 has been amended to depend on claim 3.

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Claim 5 has been amended to delete precoding according to comb  
filtering effects and this limitation has been incorporated into

claim 1. The precoder/pre-equalizer of applicant's invention is not met by multilevel encoder of Wu; the multilevel encoder of Wu does not pre-equalize for comb filter effects, but only encodes multi-level QAM symbols, a standard process for QAM and OFDM modulators.

5 Claim 5 is thus allowable.

Claim 6 is canceled.

10 Claim 7 is amended to add the limitation wherein combining the analog signal with the composite video signal comprises time domain gating of the OFDM signal with the active part of the video horizontal line, and is thus allowable.

15 Claim 8 is amended to add the limitation pre-equalizer operating on the generated in-phase and quadrature symbol streams to compensate for comb filtering effects. This amendment is similar to the amendment of the method claim 1, and thus applying the same argument, this claim is allowable.

20 Claim 9 is amended to add the limitation and at a region of spectral minimum of the video signal, similar to claim 2 amendment, and thus, this claim is allowable.

25 Claim 10 and 11 are dependent on claim 9, as amended and are thus allowable. Claim 11 has been amended to depend on claim 10.

Claim 12 is canceled.

30 Claim 13 is amended to depend on claim 8, and this is allowable in light of the amendments and arguments of claim 8.

Claim 14 is amended to add the limitation wherein the combiner to combine the analog signal with the composite video signal comprises time domain gating of the OFDM signal with the active part of the video horizontal line, similar to the amendment to claim 7, and thus is allowable under the same argument.

Claim 15 is amended to add the limitation of gating the active video line interval and applying a window to the interval to help suppress the video signal components. Gating and windowing in the receiver to suppress the video signal to avoid interference with the OFDM signal is not disclosed in Wu.

Claims 17, 18, and 19 depend on claim 15 and are thus allowable in light of the amendment and arguments of claim 15.

Claim 20 is amended to add the limitation of a gating and windowing unit operating on the digital signal, which is not disclosed in Wu, this claim 20 is allowable.

Claim 23 is dependent on claim 20 and in light of amendments and arguments to claim 20 is allowable.

#### **Allowable subject matter / objections**

Claims 16, 21, 22 were objected to as being dependent upon rejected base claims. In light of the amendments to the base claims, these claims are in condition for allowance.

**Conclusion**

In view of the foregoing, the claims not canceled and as amended are  
5 in condition for allowance and such action is respectfully  
requested.

If it is felt that direct communication would serve to advance  
prosecution of this case, the examiner is invited to call the  
10 attorney at the below listed telephone number.

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Respectfully submitted,

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